Maternal Mortality of the Chicago Maternity Center*

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IT is a privilege to present this paper on maternal mortality before the American Public Health Association. It is a matter of history that many medical discoveries have been applied through public health agencies to decrease substantially the incidence and mortality of disease. It would seem that our American mother dies too quietly and resignedly to jar the mass inertia of the nation. If a sweeping pestilence struck down as many women in a community as are taken in childbirth we would immediately be aroused.

The Children's Bureau has made careful studies of the maternal mortality of the country at large; factors contributing to a fatal outcome in the individual case have been traced and it has been found that the majority of the deaths were preventable. In the light of this knowledge there is considerable hope that the rate may yet be brought to the so-called irreducible minimum. Knowing the causes of maternal death and knowing the methods of prevention, it is your privilege to give your aid to the practising physician in an effort to lower materially the maternal death rate.

In this paper we will endeavor to show how, working under adverse conditions with a group of patients physically below par, and on a minimum budget, the Chicago Maternity Center was able to maintain a gross maternal mortality of 0.142 per cent over the 4 year period July 1, 1932, to June 30, 1936, inclusive. We will emphasize both the strong and the weak points in the service and bring out the factors which if applied to the care of maternity cases throughout the country would undoubtedly favorably influence the general maternal mortality rate.

The Chicago Maternity Center is a large outpatient obstetrical service with facilities so complete that it might well be termed a traveling hospital. Though only 4 years old, the center has inherited the fine obstetrical tradition and principles of its founder, Dr. Joseph B. De Lee, who 40 years ago established the Maxwell Street Dispensary of the Chicago Lying-in Hospital on the same site.

The purposes of the institution are twofold, first to take care of poor women in their homes during confinement, and second to teach doctors, medical students, and nurses the science and art of obstetrics. Of the 2,200,000 babies born in the United States each year, 1,400,000, or 60 per cent, are still born at home. It is therefore necessary to teach doctors and

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nurses how to care for obstetrical patients outside of the hospital.

The center delivers about 3,000 women in their homes each year. The only prerequisite for care is poverty—the inability of the patient to pay a private doctor. Registration early in pregnancy is urged, but fully 15 per cent of the cases are emergency calls which come to us either directly from the patient, the police, or some public or private charity. In addition to conducting prenatal clinics daily at the center, 3 other prenatal stations are maintained in the city. The Chicago Board of Health, the Infant Welfare Society of Chicago, and other agencies likewise conduct prenatal stations and register many cases for delivery by the center.

In this 4 year period, 14,355 women received some type of care either during pregnancy, labor, or the puerperium, in their own homes; 11,772 confinements and 269 abortions were attended at home; 556 women were hospitalized for some complication of pregnancy, 4.4 per cent; 130 of the delivered patients were later hospitalized, 1.1 per cent; 3,363 complications of pregnancy occurred in this series; 673 operative deliveries were performed upon the patients in their homes, an incidence of 6 per cent operative interferences. These were all indicated procedures and included many major operative deliveries, such as the midforcep operation, version and extraction, operative breech delivery, craniotomy, and vaginal Caesarian section; 76 abdominal low Caesarian sections were performed on patients sent into hospitals, an incidence of 1 section to every 154 deliveries; 18 per cent of the patients delivered were primiparae; 33 per cent of the women were colored.

In computing the maternal mortality we have used the figure 12,597. This is the total confinements, abortions, and women referred into hospitals by us for some complication; 1,758 women voluntarily made other arrangements for confinement care. These have not been traced. They either moved out of the city, engaged private physicians, or entered the clinical service of some hospital. They were all in good condition when they left our service. Any mortality with which we have been even remotely connected has been included in this study.

It is very difficult in any completely outpatient obstetrical service to give an accurate picture of the maternal mortality. Few of the patients die in their own homes and some complications are hospitalized before delivery. Again patients may be carried through a complication early in pregnancy and later elect to make different arrangements for confinement care. We have, however, an accurate record of every patient whom we cared for at home and have traced the subsequent course of those patients we referred to hospitals. Every death has been listed occurring at home or in the hospital, at any time during pregnancy, labor, or the puerperium.* Of the 12,597 women cared for, 18 have died, a gross mortality of 0.142 per cent. The causes of death were:

Puerperal sepsis	4
Toxemia	4
Postpartum hemorrhage	2
Tuberculosis	5
Pneumonia	2
Meningitis (torula histolytica)	1

An analysis of these deaths shows that 11 were from obstetric and 7 from non-obstetric causes. Five died undelivered in the last 3 months of pregnancy. Twelve of the confined cases delivered spontaneously and only 1 had operative interference. Five were patients first seen after they had started into

* Puerperium—6 weeks postpartum.

labor or after a complication had arisen. They had had no prenatal care. Autopsies were held on 14, or 83 per-cent, of the cases. Four cases died at home and 14 in hospitals. Fifty per cent of the women were colored. Three were primiparae and 15 multiparae. There were no deaths from abortion.

Considering the causes of death individually, tuberculosis was responsible for more deaths than any other disease. This startling fact serves as an index of the class of patient in the service: a class physically below par and thus more susceptible to the tubercle bacillus. The incidence was 1 tuberculosis death to 2,519 patients. In spite of the fact that 4 out of the 5 patients had attended prenatal clinic, a diagnosis was not made prior to the onset of acute symptoms. Autopsies were held on all. Three died from pulmonary tuberculosis and 2 from tuberculous meningitis.

Puerperal sepsis and toxemia ranked equally as a cause of death. For each there was 1 death for every 3,149 patients. Three of the 4 septic deaths had factors present which were beyond our control. There were no extenuating factors present in the fourth case other than a light respiratory infection. All of the patients delivered sponteneously at home without evidence of visible laceration. A midwife had interfered in 1 case before we were called. Autopsy showed the cause of death in the first patient to be a ruptured pus tube; in the second, gonorrheal peritonitis; in the fourth puerperal sepsis with the causative organism streptococcus hemolyticus. No necropsy was held on the third patient.

Three of the 4 patients who died of toxemia had inadequate prenatal care. The fourth patient first called the dispensary after convulsions had occurred, and upon the arrival of our doctors was in coma. Autopsies showed the cause of death in 2 to be eclampsia. The other 2 deaths occurred in patients belonging to the non-convulsive toxemia group and the cause of death appeared to be cerebral accident. Postpartum hemorrhage accounted for 2 deaths, an incidence of 1 death to 6,298 patients. These women had adequate prenatal care and easy spontaneous delivery. In both, the uterus was explored and packed. Glucose and saline were given and in 1 blood transfusion started. An autopsy was performed on only 1 patient and a partial rupture of the lower uterine segment was found.

Two patients died of pneumonia; the first followed the administration of ether for operative delivery. An autopsy was held. The second had pneumonia at the time of delivery and died 12 hours later. A rare complication accounted for the death of a woman in the 8th month of pregnancy. Autopsy revealed the cause of death to be meningitis with the causative organism a yeast-like form torula histolytica.

A careful survey of the above cases reveals that 7 of the 18 deaths can be directly traced to inadequate prenatal care. Four of the 5 patients suffering from tuberculosis had attended prenatal clinic. If a diagnosis of the disease had been made early in pregnancy by X-ray, different management might have followed with perhaps a more favorable outcome. Likewise, if there had been more adequate follow-up of delinquent patients who had not attended clinic, 3 of the 4 toxemia deaths might have been prevented. In the past 2 years we have a field nurse for this purpose.

In computing these statistics the *International Classification of the Causes of Death,* as described in *Bulletin 223* of the Children's Bureau, Washington, 1934, has not been used. An uncorrected maternal mortality rate gives a more accurate picture of the actual conditions. The gross maternal mortality rate at the center of 0.142 per cent

compares rather favorably with that of the corrected rate for the country at large of 0.59 per cent. If the center's rate were corrected, using the same basis for correction as is used for the United States, the rate for the center would fall to 0.09 per cent, or less than 1 death for every 1,000 live births.

We do not believe that these results are simply fortuitous. They show what can be accomplished working in a poverty stricken environment when the principles of sound obstetrical practice are applied to the care of the maternity case. These principles are enumerated:

1. A trained obstetrician is in complete charge of the work.
2. Adequate prenatal care is available. A field nurse follows up delinquent patients.
3. Constant attendance—A graduate doctor, a medical student, and a nurse are in constant attendance during labor.
4. There is adequate equipment and personnel for both normal and operative deliveries.
5. A simple, intensive aseptic technic is uniformly followed.
6. Isolation—The patient is cared for in a favorable environment for the obstetrical case, *i.e.*, the home. Here she is truly in an isolated unit and she is not exposed to a congregation of infected cases.
7. A minimum of operative interference—Operative intervention is only practised when an indication arises. The operative incidence is low, 6 per cent. There is conservative use of the Caesarian section operation—1:154 deliveries. Vaginal examinations are limited. The progress of labor is followed by rectal examination, and vaginal examinations are only done when a question arises about the diagnosis and then only under aseptic precautions.
8. Good hospitals are available. The efficient coöperation of Chicago's hospitals, especially Chicago Lying-in and Cook County Hospitals has saved many lives. All cases of placenta praevia and abruptio placenta are immediately hospitalized. Prospective donors are taken to the hospital with the patient. No attempt is made to establish a diagnosis on these patients at home. Four patients with ruptured uteri had rapid hysterectomy with 100 per cent good results. There was not a fatality in the 76 Caesarian sections performed entered from the center's service. Many toxemia cases were likewise hospitalized.
9. Hemorrhage control—The doctors are taught to save blood and take alarm early. If anything, blood loss is over-estimated rather than under-estimated. All patients losing over 500 c.c. of blood are immediately seen by the resident physician and all emergency treatment, including blood transfusion, is made available to the patient. No interference is permitted in the third stage of labor unless hemorrhage occurs.
10. Pituitrin taboo—The use of pituitrin is absolutely barred until after the birth of the baby. We consider this rule so important that if a doctor disregards it he is automatically dismissed from the service.
11. There is a sane use of obstetrical analgesia and of anesthesia. All repairs and 85 per cent of the operative deliveries are performed under local methods.

The application of these principles to the care of maternity cases throughout the country would undoubtedly be followed by a marked decrease in the maternal death rate. The question is "Can this be brought about under our present arrangements for the care of the obstetrical case?"

We do not wish to leave the impression that a reversion to home obstetrics is desirable. The well equipped maternity hospital is undoubtedly the ideal place for a woman to have her baby. However, we are not dealing with ideal conditions, and the results of the service of the Chicago Maternity Center show that as good results can be obtained at home as in the maternity hospital at a much lower cost to the community. From a teaching standpoint, a home service is ideal because here the students, doctors, and nurses have an opportunity to observe the patient at her bedside from the time labor starts until the case is terminated. Any home service, of course, must be complemented by a hospital service and the two, working hand in hand, can do much to lower maternal mortality and the cost of obstetrical care.